

UNITED STATES NAVAL OBSERVATORY

CIRCULAR NO. 110

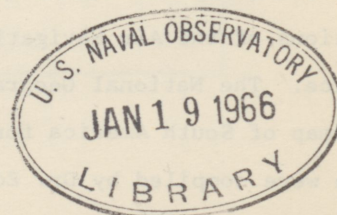
U. S. Naval Observatory, Washington, D. C. 20390

August 27, 1965

Total Solar Eclipse of 12 November 1966

by

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GENERAL INFORMATION

The path of the total phase of the solar eclipse of 12 November 1966 touches the earth at sunrise in the Pacific Ocean, west of the Galapagos Islands, and continues in a southeasterly direction, crossing the coast of Peru between Supe and Lima at approximately $13^{\text{h}}01^{\text{m}}$ U.T.

The path continues southeasterly across Peru, touching the northernmost part of Chile and the southern part of Bolivia. Next, crossing the northern part of Argentina, and touching the southwestern tip of Paraguay, the path continues across Argentina.

The path passes across southern Brazil, entering the South Atlantic Ocean south of Rio Grande at approximately $14^{\text{h}}10^{\text{m}}$ U.T. Continuing in a southeasterly direction across the South Atlantic Ocean, the eclipse reaches maximum duration ($2^{\text{m}}01^{\text{s}}.0$) at latitude $-36^{\circ}07'.8$, longitude $+47^{\circ}23'.0$. The path of the total phase leaves the earth at sunset in the Indian Ocean, south of Africa.

Partial phases of the eclipse of greater or less magnitude, decreasing with the distance from the path of the total phase, will be visible generally over most of Central America, the extreme southeastern part of the United States, the West Indies, all of South America, part of Antarctica, and the southern part of Africa.

The predictions in this *Circular* are derived from the basic data given in the American Ephemeris and Nautical Almanac for the Year 1966. The arguments are given in Universal Time, and the longitudes west of the Greenwich meridian are positive. The value of ΔT , used in the computations, is 36 seconds.

The value of 0.2724807 for k has been used in these computations except for the calculation of duration on the central line, where the value 0.272274 has been used by way of applying an approximate correction for the irregularities of the lunar limb. The duration tabulated in local circumstances is derived from the second and third contacts.

In the local circumstances, the angle P is the position angle of the point of contact, measured eastward from the north point of the solar limb, and the angle V is the position angle of the point of contact, measured eastward from the vertical circle.

The circumstances of the eclipse were plotted by the Nautical Almanac Office on portions of the Air Navigation Charts Series V30 of the United States Navy Oceanographic Office. The National Geographic Society kindly granted permission to use a portion of its map of South America for the plotting of the path of totality. The climatological data were compiled by Dr. Edward M. Brooks.

GENERAL INFORMATION (Continued)

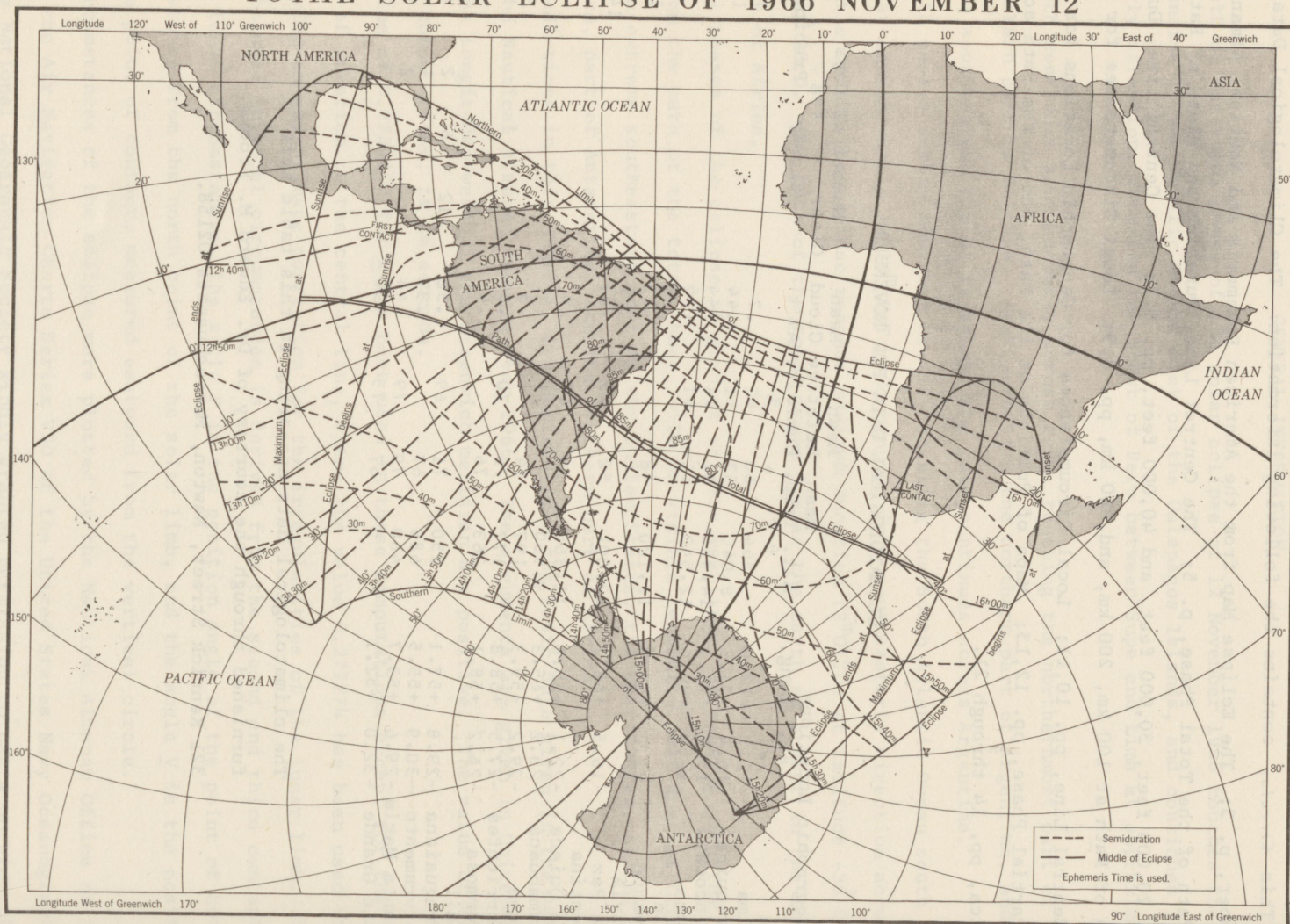
This *Circular* contains the following information: The Climatological Data for November, p. 3; The Eclipse Map from the American Ephemeris and Nautical Almanac, p. 4; The Path of the Total Phase, p. 5; The Central Line, Duration and Width of Path at 10,000 feet, 20,000 feet, 30,000 feet, and 40,000 feet, pp. 6,7; The Central Line, Duration and Width of Path at 100 km, 200 km, and 300 km, pp. 8,9; Local Circumstances for Points on the Central Line, pp. 10,11; Local Circumstances for Geographic Locations for both Total and Partial Phase, pp. 12,13; Maps of Portions of the Path, and of the Path across South America, pp. 14 through 21.

CLIMATOLOGICAL DATA FOR NOVEMBER

Geographic Locations	Lat. Long.		Alt. ft	Mean Temp. F.	Mean Relative Humidity %	Mean Cloud Am't	Number of Days			Mean Precip. in
							Clear	Fog	Precip.	
Peru										
Lima	-12.1	+77.0	364	66	82	.7			7	0.1
Arequipa	-16.4	+71.5	8,040	57	51	.44			1	<0.1
Vincocaya	-15.7	+71.1	14,350	41	54	.44				0.3
Puno	-16.0	+70.0	12,540	51	51	.65				2.3
Chile										
Oyahue	-21.2	+68.3	12,120	48		.23			1	0.3
Bolivia										
La Paz	-16.5	+68.2	12,001	52	53	.63			14	1.6
Argentina										
La Quiaca	-22.1	+65.6	11,360	54	47	.4				1.1
Humahuaca	-23.2	+65.3	9,900			.5				
Goya	-29.2	+59.3	197	74		.3			4	4.7
Corrientes	-27.5	+58.8	177	75	70	.39			5	5.3
Formosa	-26.2	+58.1	263	76		.4				7.2
Brazil										
Uruguaiana	-29.8	+57.1	250	71	69	.38	12	6	2	6
Livramento	-30.9	+55.5	688	67		.37			1	3.4
Santa Maria	-29.6	+53.7	460	70	79	.44			2	8
Rio Grande	-32.0	+52.1	5	67	75	.50			5	7

The climatological data appearing in this table were furnished through the courtesy of Dr. Edward M. Brooks, 321 Kenrick Street, Newton, Massachusetts 02158.

TOTAL SOLAR ECLIPSE OF 1966 NOVEMBER 12



PATH OF THE TOTAL PHASE

Universal Time h m	Northern Limit		Central Line		Southern Limit	
	Latitude	Longitude	Latitude	Longitude	Latitude	Longitude
Limit	+ 2 07	+103 56	+ 2 00	+104 00	+ 1 52	+104 04
12 43	+ 0 32.1	99 16.8	+ 0 40.5	100 08.8	+ 0 52.1	101 09.8
44	- 0 54.8	95 34.4	- 0 53.8	96 06.8	- 0 52.3	96 40.1
45	1 56.1	93 12.2	1 57.3	93 39.9	1 58.1	94 08.1
46	2 47.4	91 20.8	2 49.8	91 46.3	2 52.0	92 12.2
47	3 32.9	89 47.1	3 36.2	90 11.4	3 39.4	90 35.8
48	4 14.5	88 25.3	4 18.5	88 48.7	4 22.4	89 12.2
12 50	- 5 29.7	+ 86 05.6	- 5 34.8	+ 86 27.9	- 5 39.8	+ 86 50.4
52	6 37.5	84 07.5	6 43.5	84 29.2	6 49.3	84 51.0
54	7 40.3	82 24.1	7 47.0	82 45.5	7 53.4	83 06.9
56	8 39.2	80 51.7	8 46.4	81 12.8	8 53.5	81 33.9
58	9 35.0	79 27.6	9 42.8	79 48.5	9 50.4	80 09.5
13 00	-10 28.4	+ 78 10.2	-10 36.6	+ 78 31.0	-10 44.7	+ 78 52.0
05	12 33.2	75 18.9	12 42.5	75 39.6	12 51.6	76 00.4
10	14 28.9	72 50.4	14 39.0	73 11.1	14 49.0	73 31.8
15	16 17.6	70 37.7	16 28.5	70 58.4	16 39.3	71 19.2
20	18 00.8	68 36.6	18 12.4	68 57.3	18 23.9	69 18.1
25	19 39.5	66 44.0	19 51.8	67 04.7	20 04.0	67 25.5
13 30	-21 14.3	+ 64 57.7	-21 27.3	+ 65 18.4	-21 40.1	+ 65 39.2
35	22 45.9	63 16.2	22 59.4	63 36.9	23 12.9	63 57.6
40	24 14.4	61 38.1	24 28.6	61 58.7	24 42.7	62 19.4
45	25 40.4	60 02.3	25 55.1	60 22.8	26 09.7	60 43.3
50	27 03.8	58 28.0	27 19.1	58 48.3	27 34.3	59 08.6
55	28 25.0	56 54.2	28 40.9	57 14.3	28 56.6	57 34.4
14 00	-29 44.1	+ 55 20.3	-30 00.4	+ 55 40.1	-30 16.7	+ 55 59.9
05	31 01.0	53 45.6	31 17.9	54 05.0	31 34.8	54 24.5
10	32 16.0	52 09.4	32 33.4	52 28.4	32 50.8	52 47.4
15	33 29.0	50 31.2	33 46.9	50 49.6	34 04.8	51 08.1
20	34 40.0	48 50.2	34 58.4	49 08.0	35 16.7	49 25.9
25	35 48.9	47 05.9	36 07.8	47 23.0	36 26.7	47 40.2
14 30	-36 55.9	+ 45 17.6	-37 15.2	+ 45 33.9	-37 34.5	+ 45 50.3
35	38 00.7	43 24.8	38 20.4	43 40.1	38 40.1	43 55.5
40	39 03.2	41 26.5	39 23.3	41 40.8	39 43.3	41 55.2
45	40 03.3	39 22.2	40 23.7	39 35.3	40 44.1	39 48.5
50	41 00.8	37 11.1	41 21.5	37 22.8	41 42.2	37 34.6
55	41 55.4	34 52.1	42 16.4	35 02.4	42 37.3	35 12.6
15 00	-42 47.0	+ 32 24.5	-43 08.0	+ 32 33.1	-43 29.1	+ 32 41.7
05	43 35.1	29 47.1	43 56.1	29 53.9	44 17.2	30 00.5
10	44 19.2	26 58.7	44 40.2	27 03.4	45 01.2	27 08.0
15	44 58.9	23 57.8	45 19.7	24 00.4	45 40.5	24 02.8
20	45 33.4	20 42.9	45 53.9	20 43.1	46 14.4	20 43.1
25	46 02.0	17 11.9	46 21.9	17 09.5	46 41.9	17 06.9
15 30	-46 23.4	+ 13 22.1	-46 42.7	+ 13 17.1	-47 01.9	+ 13 11.7
35	46 36.3	9 10.2	46 54.6	9 02.3	47 12.9	8 54.1
40	46 38.4	+ 4 31.2	46 55.5	+ 4 20.3	47 12.5	+ 4 09.1
45	46 26.7	- 0 42.7	46 42.1	- 0 56.7	46 57.5	- 1 11.0
50	45 55.7	6 45.3	46 09.0	7 02.5	46 22.2	7 20.2
15 52	-45 35.9	- 9 29.5	-45 48.1	- 9 48.1	-46 00.2	- 10 07.3
54	45 10.2	12 29.0	45 21.2	12 49.3	45 32.0	13 10.0
56	44 36.8	15 49.3	44 46.3	16 11.4	44 55.5	16 34.0
58	43 52.2	19 40.2	43 59.8	20 04.7	44 07.1	20 29.6
16 00	-42 49.1	- 24 23.4	-42 53.9	- 24 51.8	-42 58.4	- 25 20.8
01	42 04.7	27 22.3	42 07.3	27 54.4	42 09.4	28 27.3
02	41 01.2	31 18.1	40 59.5	31 59.2	40 56.8	32 42.2
Limit	-38 23	- 39 57	-38 29	- 40 02	-38 36	- 40 07

CENTRAL LINE OF TOTAL ECLIPSE

Universal Time	10,000 Feet		20,000 Feet		30,000 Feet		40,000 Feet	
	Latitude	Longitude	Latitude	Longitude	Latitude	Longitude	Latitude	Longitude
12 43	+ 0 33.8	+ 99 48.2	+ 0 27.6	+ 99 29.0	+ 0 21.9	+ 99 11.2	+ 0 16.4	+ 98 54.3
44	- 0 57.1	95 56.7	- 1 00.3	95 46.8	- 1 03.4	95 37.0	- 1 06.5	95 27.5
45	1 59.7	93 32.3	2 02.1	93 24.8	2 04.5	93 17.4	2 06.8	93 10.1
46	2 51.8	91 40.0	2 53.8	91 33.8	2 55.8	91 27.6	2 57.7	91 21.4
47	3 38.0	90 05.9	3 39.7	90 00.4	3 41.4	89 55.0	3 43.1	89 49.6
48	4 20.1	88 43.8	4 21.6	88 38.9	4 23.1	88 34.0	4 24.6	88 29.1
12 50	- 5 36.1	+ 86 23.8	- 5 37.3	+ 86 19.6	- 5 38.6	+ 86 15.5	- 5 39.8	+ 86 11.4
52	6 44.6	84 25.5	6 45.7	84 21.9	6 46.7	84 18.3	6 47.8	84 14.6
54	7 47.9	82 42.2	7 48.8	82 38.9	7 49.8	82 35.6	7 50.7	82 32.4
56	8 47.3	81 09.7	8 48.1	81 06.7	8 48.9	81 03.8	8 49.7	81 00.8
58	9 43.5	79 45.7	9 44.2	79 43.0	9 45.0	79 40.2	9 45.7	79 37.5
13 00	-10 37.3	+ 78 28.5	-10 37.9	+ 78 25.9	-10 38.6	+ 78 23.3	-10 39.2	+ 78 20.7
05	12 43.0	75 37.4	12 43.5	75 35.2	12 44.0	75 33.0	12 44.5	75 30.7
10	14 39.4	73 09.1	14 39.7	73 07.2	14 40.1	73 05.2	14 40.5	73 03.3
15	16 28.8	70 56.7	16 29.0	70 54.9	16 29.3	70 53.2	16 29.6	70 51.4
20	18 12.6	68 55.7	18 12.8	68 54.1	18 13.0	68 52.6	18 13.1	68 51.0
25	19 51.9	67 03.3	19 52.0	67 01.8	19 52.1	67 00.4	19 52.2	66 58.9
13 30	-21 27.3	+ 65 17.1	-21 27.3	+ 65 15.8	-21 27.4	+ 65 14.5	-21 27.4	+ 65 13.2
35	22 59.4	63 35.7	22 59.4	63 34.5	22 59.3	63 33.3	22 59.3	63 32.1
40	24 28.5	61 57.6	24 28.4	61 56.5	24 28.3	61 55.4	24 28.2	61 54.3
45	25 54.9	60 21.8	25 54.8	60 20.8	25 54.6	60 19.8	25 54.5	60 18.8
50	27 18.9	58 47.3	27 18.7	58 46.4	27 18.5	58 45.5	27 18.3	58 44.6
55	28 40.6	57 13.4	28 40.3	57 12.6	28 40.1	57 11.8	28 39.8	57 11.0
14 00	-30 00.1	+ 55 39.3	-29 59.8	+ 55 38.6	-29 59.5	+ 55 37.9	-29 59.2	+ 55 37.2
05	31 17.6	54 04.3	31 17.2	54 03.7	31 16.8	54 03.1	31 16.5	54 02.4
10	32 33.0	52 27.8	32 32.6	52 27.3	32 32.2	52 26.7	32 31.8	52 26.2
15	33 46.4	50 49.1	33 46.0	50 48.7	33 45.5	50 48.2	33 45.1	50 47.8
20	34 57.9	49 07.7	34 57.4	49 07.3	34 56.9	49 06.9	34 56.4	49 06.6
25	36 07.3	47 22.8	36 06.7	47 22.5	36 06.2	47 22.3	36 05.7	47 22.0
14 30	-37 14.6	+ 45 33.8	-37 14.0	+ 45 33.6	-37 13.5	+ 45 33.5	-37 12.9	+ 45 33.3
35	38 19.8	43 40.1	38 19.1	43 40.0	38 18.5	43 40.0	38 17.9	43 40.0
40	39 22.6	41 40.9	39 22.0	41 41.0	39 21.3	41 41.1	39 20.7	41 41.2
45	40 23.0	39 35.6	40 22.3	39 35.8	40 21.6	39 36.0	40 21.0	39 36.2
50	41 20.8	37 23.2	41 20.1	37 23.6	41 19.3	37 23.9	41 18.6	37 24.3
55	42 15.6	35 02.9	42 14.9	35 03.5	42 14.2	35 04.0	42 13.4	35 04.5
15 00	-43 07.3	+ 32 33.8	-43 06.5	+ 32 34.5	-43 05.8	+ 32 35.2	-43 05.0	+ 32 35.9
05	43 55.4	29 54.7	43 54.6	29 55.6	43 53.8	29 56.5	43 53.1	29 57.4
10	44 39.4	27 04.5	44 38.7	27 05.6	44 37.9	27 06.7	44 37.1	27 07.8
15	45 18.9	24 01.7	45 18.2	24 03.0	45 17.4	24 04.4	45 16.6	24 05.7
20	45 53.1	20 44.7	45 52.4	20 46.3	45 51.6	20 47.9	45 50.9	20 49.4
25	46 21.2	17 11.4	46 20.5	17 13.3	46 19.7	17 15.2	46 19.0	17 17.0
15 30	-46 42.0	+ 13 19.3	-46 41.3	+ 13 21.5	-46 40.6	+ 13 23.8	-46 39.9	+ 13 26.0
35	46 53.9	9 05.0	46 53.3	9 07.6	46 52.7	9 10.2	46 52.1	9 12.8
40	46 54.9	+ 4 23.4	46 54.4	+ 4 26.5	46 53.9	+ 4 29.6	46 53.4	+ 4 32.7
45	46 41.8	- 0 53.0	46 41.4	- 0 49.3	46 41.0	- 0 45.6	46 40.6	- 0 41.9
50	46 08.9	6 58.0	46 08.8	6 53.4	46 08.6	6 48.9	46 08.5	6 44.4
15 52	-45 48.1	- 9 43.2	-45 48.1	- 9 38.2	-45 48.1	- 9 33.2	-45 48.1	- 9 28.3
54	45 21.4	12 43.7	45 21.5	12 38.2	45 21.7	12 32.7	45 21.9	12 27.2
56	44 46.7	16 05.1	44 47.1	15 58.8	44 47.5	15 52.6	44 47.9	15 46.4
58	44 00.6	19 57.2	44 01.4	19 49.8	44 02.2	19 42.4	44 03.0	19 35.1
16 00	-42 55.5	- 24 42.2	-42 57.0	- 24 32.7	-42 58.5	- 24 23.3	-42 59.9	- 24 14.0
01	42 09.6	27 42.7	42 11.9	27 31.1	42 14.0	27 19.7	42 16.2	27 08.4
02	-41 03.6	- 31 42.1	-41 07.5	- 31 25.6	-41 11.2	- 31 09.5	41 14.8	30 53.9
03	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	-38 45.4	- 39 02.4

DURATION OF TOTAL PHASE AND WIDTH OF PATH ON CENTRAL LINE

Universal Time	10,000 Feet		20,000 Feet		30,000 Feet		40,000 Feet	
	Duration	Width of Path	Duration	Width of Path	Duration	Width of Path	Duration	Width of Path
h m	m s	mi	m s	mi	m s	mi	m s	mi
12 43	0 29.5	23	0 29.9	23	0 30.3	24	0 30.6	24
44	0 34.9	26	0 35.1	26	0 35.3	27	0 35.5	27
45	0 38.5	29	0 38.7	29	0 38.9	29	0 39.0	29
46	0 41.5	30	0 41.6	30	0 41.8	30	0 41.9	30
47	0 44.1	32	0 44.2	32	0 44.4	32	0 44.5	32
48	0 46.5	33	0 46.6	33	0 46.7	33	0 46.8	33
12 50	0 50.7	35	0 50.8	36	0 50.9	36	0 51.0	36
52	0 54.4	37	0 54.5	37	0 54.6	37	0 54.7	37
54	0 57.8	39	0 57.9	39	0 58.0	39	0 58.1	39
56	1 01.0	40	1 01.1	40	1 01.2	40	1 01.3	41
58	1 03.9	41	1 04.0	41	1 04.1	41	1 04.2	41
13 00	1 06.7	43	1 06.8	43	1 06.9	43	1 07.0	43
05	1 13.1	45	1 13.2	45	1 13.3	45	1 13.3	45
10	1 18.8	48	1 18.9	48	1 19.0	48	1 19.1	48
15	1 24.0	49	1 24.1	49	1 24.2	49	1 24.2	49
20	1 28.7	50	1 28.8	50	1 28.9	50	1 28.9	50
25	1 33.0	52	1 33.1	52	1 33.2	52	1 33.3	52
13 30	1 36.9	52	1 37.0	52	1 37.1	52	1 37.2	52
35	1 40.5	53	1 40.6	53	1 40.7	53	1 40.7	53
40	1 43.7	53	1 43.8	53	1 43.9	53	1 44.0	53
45	1 46.6	54	1 46.7	54	1 46.8	54	1 46.8	54
50	1 49.2	54	1 49.2	54	1 49.3	54	1 49.4	54
55	1 51.4	55	1 51.4	55	1 51.5	55	1 51.6	55
14 00	1 53.2	55	1 53.3	55	1 53.4	55	1 53.5	55
05	1 54.7	55	1 54.8	55	1 54.9	55	1 55.0	55
10	1 55.9	55	1 56.0	55	1 56.1	55	1 56.1	55
15	1 56.8	55	1 56.8	54	1 56.9	54	1 57.0	54
20	1 57.2	54	1 57.3	54	1 57.4	54	1 57.5	54
25	1 57.3	54	1 57.4	54	1 57.5	54	1 57.6	54
14 30	1 57.1	54	1 57.2	54	1 57.2	54	1 57.3	53
35	1 56.5	53	1 56.5	53	1 56.6	53	1 56.7	53
40	1 55.5	52	1 55.5	52	1 55.6	52	1 55.7	52
45	1 54.1	52	1 54.1	52	1 54.2	52	1 54.3	52
50	1 52.3	52	1 52.4	52	1 52.4	52	1 52.5	52
55	1 50.1	51	1 50.2	51	1 50.3	51	1 50.4	51
15 00	1 47.6	50	1 47.6	50	1 47.7	50	1 47.8	50
05	1 44.6	49	1 44.7	49	1 44.8	49	1 44.8	49
10	1 41.2	48	1 41.3	48	1 41.4	48	1 41.5	48
15	1 37.4	48	1 37.5	48	1 37.6	48	1 37.7	48
20	1 33.2	46	1 33.3	46	1 33.4	46	1 33.4	46
25	1 28.6	45	1 28.6	45	1 28.7	45	1 28.8	45
15 30	1 23.5	44	1 23.5	44	1 23.6	44	1 23.7	44
35	1 17.8	42	1 17.9	42	1 18.0	42	1 18.1	42
40	1 11.7	40	1 11.7	40	1 11.8	40	1 11.9	40
45	1 04.8	37	1 04.9	37	1 05.0	37	1 05.1	37
50	0 57.1	35	0 57.2	35	0 57.3	35	0 57.4	35
15 52	0 53.7	33	0 53.8	33	0 53.9	33	0 54.0	33
54	0 50.0	32	0 50.1	32	0 50.2	32	0 50.3	32
56	0 45.9	30	0 46.1	30	0 46.2	30	0 46.3	30
58	0 41.4	28	0 41.5	29	0 41.7	29	0 41.8	29
16 00	0 36.0	25	0 36.1	25	0 36.3	25	0 36.5	25
01	0 32.7	24	0 32.9	24	0 33.1	24	0 33.2	24
02	0 28.4	21	0 28.7	21	0 28.9	21	0 29.2	22
03	. . . .	...	. . . .	...	. . . .	...	0 20.9	17

CENTRAL LINE OF TOTAL ECLIPSE

Universal Time	100 Km		200 Km		300 Km	
	Latitude	Longitude	Latitude	Longitude	Latitude	Longitude
12 38	.. .. .	... .. .	.. .. .	... .. .	+ 1 02.3	+ 97 13.3
39	.. .. .	... .. .	.. .. .	... .. .	- 0 16.6	93 57.4
40	.. .. .	... .. .	+ 0 21.6	+ 96 43.0	1 14.9	91 45.0
41	+ 1 44.7	+101 48.9	- 0 50.3	93 49.0	2 04.2	89 59.8
12 42	- 0 16.7	+ 96 21.8	- 1 46.3	+ 91 44.1	- 2 48.2	+ 88 30.8
44	2 17.9	91 44.6	3 17.8	88 36.2	4 06.0	86 02.8
46	3 47.9	88 42.2	4 35.1	86 10.8	5 15.2	84 00.4
48	5 04.6	86 19.2	5 44.0	84 09.8	6 18.5	82 14.8
12 50	- 6 13.4	+ 84 19.4	- 6 47.3	+ 82 24.9	- 7 17.6	+ 80 41.2
55	8 44.5	80 19.1	9 09.4	78 48.0	9 32.1	77 23.3
13 00	-10 57.2	+ 77 08.9	-11 16.1	+ 75 51.9	-11 33.5	+ 74 39.4
05	12 58.1	74 28.7	13 12.6	73 21.5	13 26.0	72 17.8
10	14 50.7	72 08.4	15 01.6	71 08.7	15 11.7	70 11.7
15	16 36.9	70 02.2	16 44.8	69 08.5	16 52.0	68 17.0
20	18 18.0	68 06.4	18 23.2	67 17.7	18 27.9	66 30.9
25	19 54.9	66 18.4	19 57.6	65 33.9	20 00.1	64 51.1
13 30	-21 28.1	+ 64 36.1	-21 28.6	+ 63 55.5	-21 29.0	+ 63 16.3
35	22 58.1	62 58.2	22 56.6	62 21.0	22 55.1	61 45.1
40	24 25.3	61 23.4	24 21.9	60 49.3	24 18.5	60 16.5
45	25 49.9	59 50.6	25 44.7	59 19.6	25 39.7	58 49.6
50	27 12.1	58 19.1	27 05.3	57 50.9	26 58.6	57 23.8
55	28 32.2	56 48.0	28 23.7	56 22.6	28 15.5	55 58.2
14 00	-29 50.2	+ 55 16.7	-29 40.1	+ 54 54.1	-29 30.4	+ 54 32.4
05	31 06.1	53 44.5	30 54.6	53 24.7	30 43.4	53 05.6
10	32 20.1	52 10.8	32 07.2	51 53.8	31 54.6	51 37.5
15	33 32.1	50 35.0	33 17.8	50 20.9	33 04.0	50 07.4
20	34 42.3	48 56.5	34 26.6	48 45.5	34 11.5	48 34.8
25	35 50.4	47 14.8	35 33.5	47 06.9	35 17.2	46 59.3
14 30	-36 56.5	+ 45 29.1	-36 38.4	+ 45 24.5	-36 20.9	+ 45 20.1
35	38 00.5	43 39.0	37 41.3	43 37.9	37 22.7	43 36.8
40	39 02.3	41 43.6	38 42.1	41 46.3	38 22.5	41 48.8
45	40 01.7	39 42.4	39 40.5	39 49.1	39 20.0	39 55.5
50	40 58.6	37 34.4	40 36.5	37 45.5	40 15.1	37 56.1
55	41 52.7	35 19.0	41 29.9	35 34.9	41 07.7	35 50.0
15 00	-42 43.8	+ 32 55.2	-42 20.3	+ 33 16.3	-41 57.5	+ 33 36.4
05	43 31.4	30 22.0	43 07.4	30 48.8	42 44.2	31 14.4
10	44 15.2	27 38.3	43 51.0	28 11.4	43 27.5	28 43.0
15	44 54.7	24 42.7	44 30.4	25 22.9	44 06.8	26 01.0
20	45 29.3	21 33.8	45 05.2	22 21.8	44 41.8	23 07.3
25	45 58.0	18 09.7	45 34.7	19 06.5	45 11.8	20 00.3
15 30	-46 20.1	+ 14 28.1	-45 57.8	+ 15 35.0	-45 35.9	+ 16 38.1
35	46 34.0	10 25.9	46 13.4	11 44.4	45 53.0	12 58.3
40	46 37.9	5 58.9	46 19.9	7 31.1	46 01.8	8 57.5
45	46 29.1	+ 1 00.6	46 15.0	+ 2 49.6	46 00.3	+ 4 31.3
50	46 03.1	- 4 39.9	45 55.1	- 2 28.9	45 45.3	- 0 27.9
55	45 11.6	11 24.8	45 13.5	8 41.3	45 11.9	6 13.0
15 00	-43 32.9	- 20 14.0	-43 56.0	- 16 27.1	-44 09.7	- 13 12.0
02	42 24.2	25 06.6	43 06.4	20 23.5	43 31.5	16 34.7
04	-40 17.7	- 32 47.5	41 54.5	25 22.9	42 40.2	20 33.5
16 05	.. .. .	... .. .	-41 01.0	- 28 43.5	-42 06.8	- 22 54.7
06	.. .. .	... .. .	-39 29.9	- 33 55.4	41 24.7	25 41.0
07	.. .. .	... .. .	.. .. .	... .. .	40 26.3	29 14.7
08	.. .. .	... .. .	.. .. .	... .. .	-38 23.4	- 36 01.2

DURATION OF TOTAL PHASE AND WIDTH OF PATH ON CENTRAL LINE

Universal Time h m	100 Km		200 Km		300 Km	
	Duration m s	Width of Path mi	Duration m s	Width of Path mi	Duration m s	Width of Path mi
12 38	. . . .	...	. . . .	...	0 31.3	24
39	. . . .	...	. . . .	...	0 36.2	27
40	. . . .	...	0 32.6	25	0 39.7	29
41	. . . .	...	0 37.0	28	0 42.7	31
12 42	0 33.7	26	0 40.3	29	0 45.3	32
44	0 40.9	30	0 45.7	33	0 49.9	35
46	0 46.0	33	0 50.2	35	0 54.0	37
48	0 50.4	35	0 54.1	37	0 57.6	39
12 50	0 54.2	37	0 57.7	38	1 01.0	40
55	1 02.5	41	1 05.5	43	1 08.5	43
13 00	1 09.5	44	1 12.4	45	1 15.2	46
05	1 15.7	46	1 18.5	47	1 21.2	48
10	1 21.4	48	1 24.0	49	1 26.7	50
15	1 26.5	50	1 29.1	51	1 31.7	51
20	1 31.2	51	1 33.7	52	1 36.3	52
25	1 35.5	52	1 38.0	53	1 40.5	53
13 30	1 39.4	53	1 41.9	54	1 44.4	54
35	1 42.9	54	1 45.4	54	1 47.9	55
40	1 46.1	54	1 48.6	55	1 51.1	56
45	1 49.0	55	1 51.5	55	1 54.0	56
50	1 51.5	55	1 54.0	56	1 56.6	56
55	1 53.7	55	1 56.3	56	1 58.8	56
14 00	1 55.6	55	1 58.2	56	2 00.7	56
05	1 57.2	55	1 59.7	56	2 02.2	56
10	1 58.3	55	2 00.9	56	2 03.5	56
15	1 59.2	55	2 01.8	56	2 04.3	56
20	1 59.7	55	2 02.3	56	2 04.8	56
25	1 59.8	55	2 02.4	55	2 05.0	56
14 30	1 59.6	54	2 02.2	55	2 04.8	56
35	1 58.9	54	2 01.6	54	2 04.2	55
40	1 58.0	53	2 00.6	54	2 03.2	55
45	1 56.6	53	1 59.2	53	2 01.9	54
50	1 54.8	52	1 57.5	52	2 00.1	53
55	1 52.7	52	1 55.3	52	1 58.0	52
15 00	1 50.1	51	1 52.8	52	1 55.5	52
05	1 47.2	50	1 49.8	51	1 52.6	51
10	1 43.8	49	1 46.5	50	1 49.2	51
15	1 40.0	48	1 42.7	48	1 45.5	49
20	1 35.8	47	1 38.6	47	1 41.3	48
25	1 31.2	46	1 34.0	47	1 36.8	47
15 30	1 26.1	44	1 28.9	45	1 31.8	46
35	1 20.6	43	1 23.4	43	1 26.3	44
40	1 14.5	40	1 17.4	42	1 20.3	42
45	1 07.8	39	1 10.8	39	1 13.8	41
50	1 00.2	35	1 03.5	37	1 06.6	38
55	0 51.6	32	0 55.2	34	0 58.6	35
16 00	0 40.8	28	0 45.2	29	0 49.2	32
02	0 35.2	25	0 40.4	28	0 44.9	30
04	0 26.8	21	0 34.5	25	0 39.9	27
16 05	. . . .	...	0 30.7	23	0 37.0	26
06	. . . .	...	0 25.0	20	0 33.7	24
07	. . . .	...	. . . .	...	0 29.6	22
08	. . . .	...	. . . .	...	0 22.2	18

LOCAL CIRCUMSTANCES FOR POINTS ON CENTRAL LINE

Central Line			First Contact			Second Contact		
Universal Time	Latitude	Longitude	Universal Time	P	V	Universal Time	P	V
h m	° ' "	° ' "	h m s	°	°	h m s	°	°
12 43	+ 0 40.5	+100 08.8	.. .. .	...	...	12 42 44.2	119	207
44	- 0 53.8	96 06.8	.. .. .	...	...	12 43 41.3	120	209
45	1 57.3	93 39.9	.. .. .	...	...	12 44 39.5	121	209
46	2 49.8	91 46.3	11 49 01.6	300	33	12 45 38.0	121	210
47	3 36.2	90 11.4	11 49 20.3	300	33	12 46 36.7	122	210
48	4 18.5	88 48.7	11 49 43.0	301	34	12 47 35.5	122	211
12 50	- 5 34.8	+ 86 27.9	11 50 36.3	301	35	12 49 33.3	123	212
52	6 43.5	84 29.2	11 51 36.8	302	36	12 51 31.4	123	213
54	7 47.0	82 45.5	11 52 42.2	302	37	12 53 29.6	124	214
56	8 46.4	81 12.8	11 53 51.4	302	37	12 55 28.1	124	215
58	9 42.8	79 48.5	11 55 03.5	303	38	12 57 26.6	124	215
13 00	-10 36.6	+ 78 31.0	11 56 18.1	303	39	12 59 25.1	125	216
05	12 42.5	75 39.6	11 59 32.6	304	41	13 04 21.9	125	218
10	14 39.0	73 11.1	12 02 56.4	304	43	13 09 19.0	126	220
15	16 28.5	70 58.4	12 06 27.1	305	44	13 14 16.4	126	222
20	18 12.4	68 57.3	12 10 03.5	305	46	13 19 14.0	127	224
25	19 51.8	67 04.7	12 13 45.0	305	48	13 24 11.8	127	227
13 30	-21 27.3	+ 65 18.4	12 17 30.9	306	49	13 29 09.8	127	229
35	22 59.4	63 36.9	12 21 20.8	306	51	13 34 08.0	127	232
40	24 28.6	61 58.7	12 25 14.6	306	53	13 39 06.4	127	235
45	25 55.1	60 22.8	12 29 12.3	306	55	13 44 04.9	127	238
50	27 19.1	58 48.3	12 33 13.6	306	57	13 49 03.6	127	242
55	28 40.9	57 14.3	12 37 18.7	306	59	13 54 02.5	127	247
14 00	-30 00.4	+ 55 40.1	12 41 27.5	306	62	13 59 01.6	126	252
05	31 17.9	54 05.0	12 45 40.3	306	64	14 04 00.8	126	257
10	32 33.4	52 28.4	12 49 57.1	306	67	14 09 00.2	126	264
15	33 46.9	50 49.6	12 54 18.0	305	70	14 13 59.8	125	271
20	34 58.4	49 08.0	12 58 43.4	305	73	14 18 59.5	125	278
25	36 07.8	47 23.0	13 03 13.6	305	77	14 23 59.5	124	286
14 30	-37 15.2	+ 45 33.9	13 07 48.8	304	81	14 28 59.6	123	293
35	38 20.4	43 40.1	13 12 29.3	304	86	14 33 59.9	123	300
40	39 23.3	41 40.8	13 17 15.6	303	91	14 39 00.4	122	306
45	40 23.7	39 35.3	13 22 08.0	303	96	14 44 01.1	121	312
50	41 21.5	37 22.8	13 27 07.1	302	101	14 49 02.0	121	317
55	42 16.4	35 02.4	13 32 13.3	301	107	14 54 03.1	120	321
15 00	-43 08.0	+ 32 33.1	13 37 27.2	301	113	14 59 04.4	119	324
05	43 56.1	29 53.9	13 42 49.4	300	119	15 04 05.9	118	327
10	44 40.2	27 03.4	13 48 20.5	299	125	15 09 07.6	117	329
15	45 19.7	24 00.4	13 54 01.3	298	131	15 14 09.5	116	331
20	45 53.9	20 43.1	13 59 52.6	297	136	15 19 11.6	115	332
25	46 21.9	17 09.5	14 05 55.4	296	140	15 24 14.0	114	333
15 30	-46 42.7	+ 13 17.1	14 12 10.7	295	144	15 29 16.6	113	334
35	46 54.6	9 02.3	14 18 40.0	294	147	15 34 19.4	112	335
40	46 55.5	+ 4 20.3	14 25 25.2	293	150	15 39 22.6	111	335
45	46 42.1	- 0 56.7	14 32 29.2	291	152	15 44 26.0	110	335
50	46 09.0	7 02.5	14 39 57.2	290	154	15 49 30.0	109	335
15 52	-45 48.1	- 9 48.1	14 43 05.2	289	155	15 51 31.7	108	335
54	45 21.2	12 49.3	14 46 19.9	289	156	15 53 33.6	108	335
56	44 46.3	16 11.4	14 49 43.1	288	156	15 55 35.6	107	335
58	43 59.8	20 04.7	14 53 18.7	287	157	15 57 38.0	106	335
16 00	-42 53.9	- 24 51.8	14 57 14.9	287	157	15 59 40.7	106	335
01	42 07.3	27 54.4	14 59 27.5	286	157	16 00 42.4	105	334
02	-40 59.5	- 31 59.2	15 02 02.6	286	157	16 01 44.6	105	334

LOCAL CIRCUMSTANCES FOR POINTS ON CENTRAL LINE

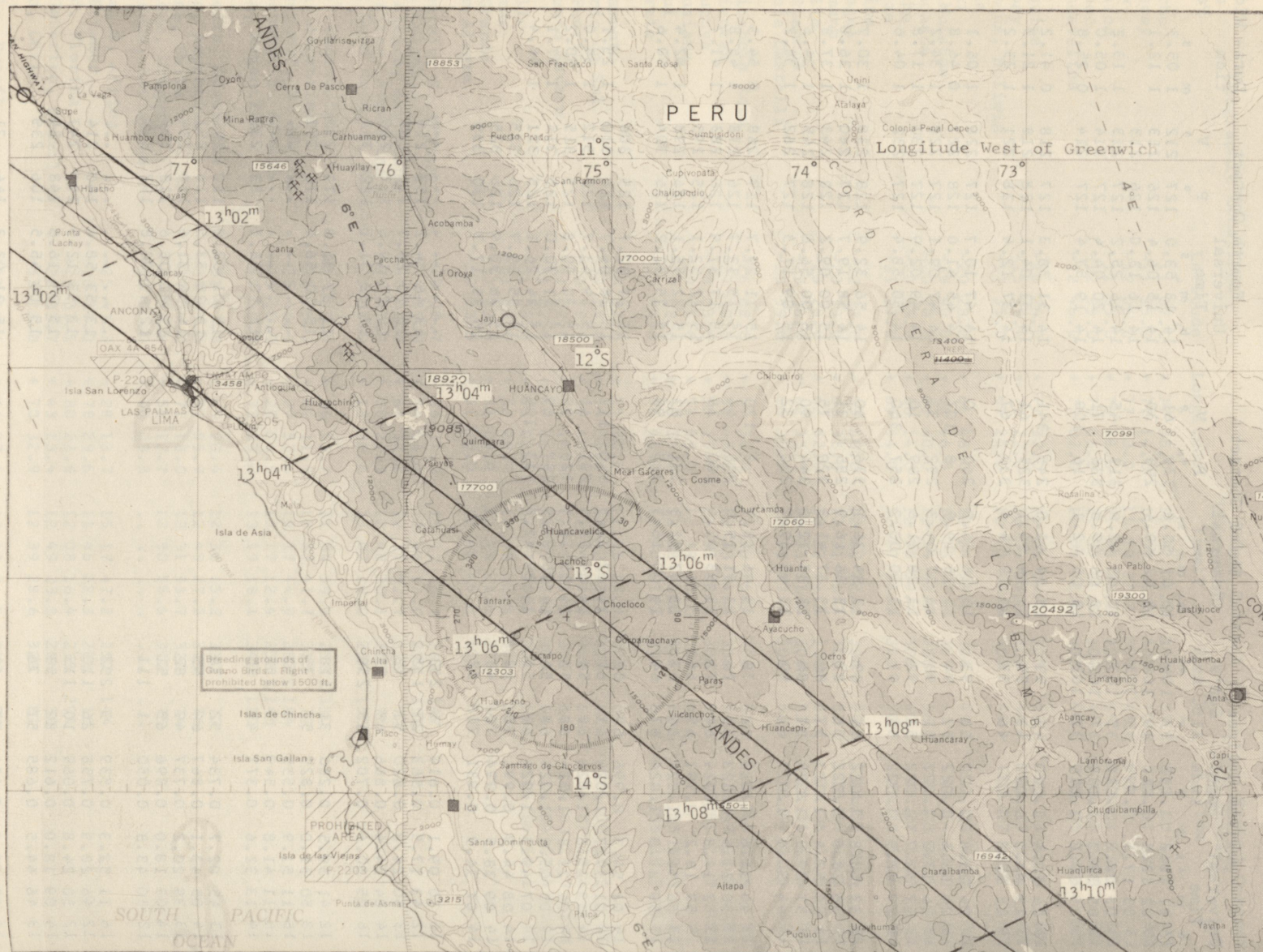
Maximum Eclipse				Third Contact			Fourth Contact			Dura- Width	
Universal	Magni-	Sun's		Universal	P	V	Universal	P	V	tion	of
Time	tude	Alt. Az.		Time			Time				Path
^h _h ^m _m ^s _s		[°] _° ['] _' ["] _"		^h _h ^m _m ^s _s	[°] _° ['] _' ["] _"	[°] _° ['] _' ["] _"	^h _h ^m _m ^s _s	[°] _° ['] _' ["] _"	[°] _° ['] _' ["] _"	^m _m ^s _s	^{mi} _{mi}
12 43 00.0	1.009	4 108		12 43 15.8	299	27	13 42 03.4	121	204	0 31.6	23
12 44 00.0	1.011	9 108		12 44 18.7	300	29	13 44 59.3	122	205	0 37.4	26
12 45 00.0	1.012	12 108		12 45 20.5	301	29	13 47 15.4	123	206	0 41.0	29
12 46 00.0	1.012	14 107		12 46 22.0	301	30	13 49 17.5	123	206	0 44.0	30
12 47 00.0	1.013	16 107		12 47 23.3	302	31	13 51 11.5	123	207	0 46.6	32
12 48 00.0	1.013	18 107		12 48 24.5	302	31	13 53 00.4	124	207	0 49.0	33
12 50 00.0	1.014	21 107		12 50 26.7	303	32	13 56 27.1	124	208	0 53.4	35
12 52 00.0	1.015	23 106		12 52 28.6	303	33	13 59 44.0	125	209	0 57.2	37
12 54 00.0	1.016	26 106		12 54 30.4	304	34	14 02 53.8	125	210	1 00.8	39
12 56 00.0	1.016	28 105		12 56 31.9	304	35	14 05 58.4	126	210	1 03.8	40
12 58 00.0	1.017	30 105		12 58 33.4	304	35	14 08 58.6	126	211	1 06.8	41
13 00 00.0	1.017	32 104		13 00 34.9	305	36	14 11 55.2	126	212	1 09.8	43
13 05 00.0	1.018	36 103		13 05 38.1	305	38	14 19 03.9	127	214	1 16.2	45
13 10 00.0	1.019	40 101		13 10 41.0	306	40	14 25 57.9	127	216	1 22.0	48
13 15 00.0	1.020	44 99		13 15 43.6	306	42	14 32 39.9	127	219	1 27.2	49
13 20 00.0	1.021	47 97		13 20 46.0	307	44	14 39 11.3	128	222	1 32.0	50
13 25 00.0	1.021	50 94		13 25 48.2	307	47	14 45 33.1	128	227	1 36.4	52
13 30 00.0	1.022	53 91		13 30 50.2	307	49	14 51 46.0	128	232	1 40.4	52
13 35 00.0	1.022	56 88		13 35 52.0	307	52	14 57 50.2	127	240	1 44.0	53
13 40 00.0	1.023	58 84		13 40 53.6	307	55	15 03 46.1	127	250	1 47.2	53
13 45 00.0	1.023	61 80		13 45 55.1	307	58	15 09 34.0	127	262	1 50.2	54
13 50 00.0	1.023	63 75		13 50 56.4	307	62	15 15 13.7	127	277	1 52.8	54
13 55 00.0	1.024	65 69		13 55 57.5	307	67	15 20 45.7	126	292	1 55.0	55
14 00 00.0	1.024	67 63		14 00 58.4	306	72	15 26 09.7	126	305	1 56.8	55
14 05 00.0	1.024	68 56		14 05 59.2	306	78	15 31 25.8	125	315	1 58.4	55
14 10 00.0	1.024	69 48		14 10 59.8	306	85	15 36 34.3	125	322	1 59.6	55
14 15 00.0	1.024	70 39		14 16 00.2	305	92	15 41 35.0	124	328	2 00.4	55
14 20 00.0	1.024	70 30		14 21 00.5	305	99	15 46 28.1	123	332	2 01.0	54
14 25 00.0	1.024	70 21		14 26 00.5	304	107	15 51 13.7	123	335	2 01.0	54
14 30 00.0	1.024	70 12		14 31 00.4	303	114	15 55 52.0	122	336	2 00.8	54
14 35 00.0	1.024	69 3		14 36 00.1	303	121	16 00 22.9	121	338	2 00.2	53
14 40 00.0	1.024	68 354		14 40 59.6	302	127	16 04 46.8	120	339	1 59.2	52
14 45 00.0	1.024	67 346		14 45 58.9	301	133	16 09 03.5	119	339	1 57.8	52
14 50 00.0	1.023	65 339		14 50 58.0	301	138	16 13 13.5	119	340	1 56.0	52
14 55 00.0	1.023	63 332		14 55 56.9	300	141	16 17 16.7	118	340	1 53.8	51
15 00 00.0	1.023	61 326		15 00 55.6	299	145	16 21 13.3	117	340	1 51.2	50
15 05 00.0	1.022	59 320		15 05 54.1	298	147	16 25 03.4	116	339	1 48.2	49
15 10 00.0	1.022	56 315		15 10 52.4	297	149	16 28 47.1	115	339	1 44.8	48
15 15 00.0	1.021	53 310		15 15 50.5	296	151	16 32 24.3	114	339	1 41.0	48
15 20 00.0	1.021	51 305		15 20 48.4	295	152	16 35 55.0	113	338	1 35.8	46
15 25 00.0	1.020	48 300		15 25 46.0	294	154	16 39 18.9	112	337	1 32.0	45
15 30 00.0	1.019	44 295		15 30 43.4	293	154	16 42 35.8	111	337	1 26.8	44
15 35 00.0	1.019	41 289		15 35 40.6	292	155	16 45 44.8	110	336	1 21.2	42
15 40 00.0	1.018	37 284		15 40 37.4	291	155	16 48 45.0	109	335	1 14.8	40
15 45 00.0	1.016	32 279		15 45 34.0	290	155	16 51 34.3	108	334	1 08.0	37
15 50 00.0	1.015	27 273		15 50 30.0	289	155	16 54 08.7	107	334	1 00.0	35
15 52 00.0	1.014	25 270		15 52 28.3	288	155	16 55 04.7	107	333	0 55.6	33
15 54 00.0	1.014	23 267		15 54 26.4	288	155	16 55 56.2	107	333	0 52.8	32
15 56 00.0	1.013	20 265		15 56 24.4	287	155	16 56 41.3	106	332	0 48.8	30
15 58 00.0	1.012	17 261		15 58 22.0	286	155	16 57 17.5	106	331	0 44.0	28
16 00 00.0	1.011	13 258		16 00 19.3	286	155	16 57 37.7	105	331	0 38.6	25
16 01 00.0	1.010	10 255		16 01 17.6	285	154	16 57 36.5	105	330	0 35.2	24
16 02 00.0	1.009	7 252		16 02 15.4	285	154	.. .. .	...	...	0 30.8	21

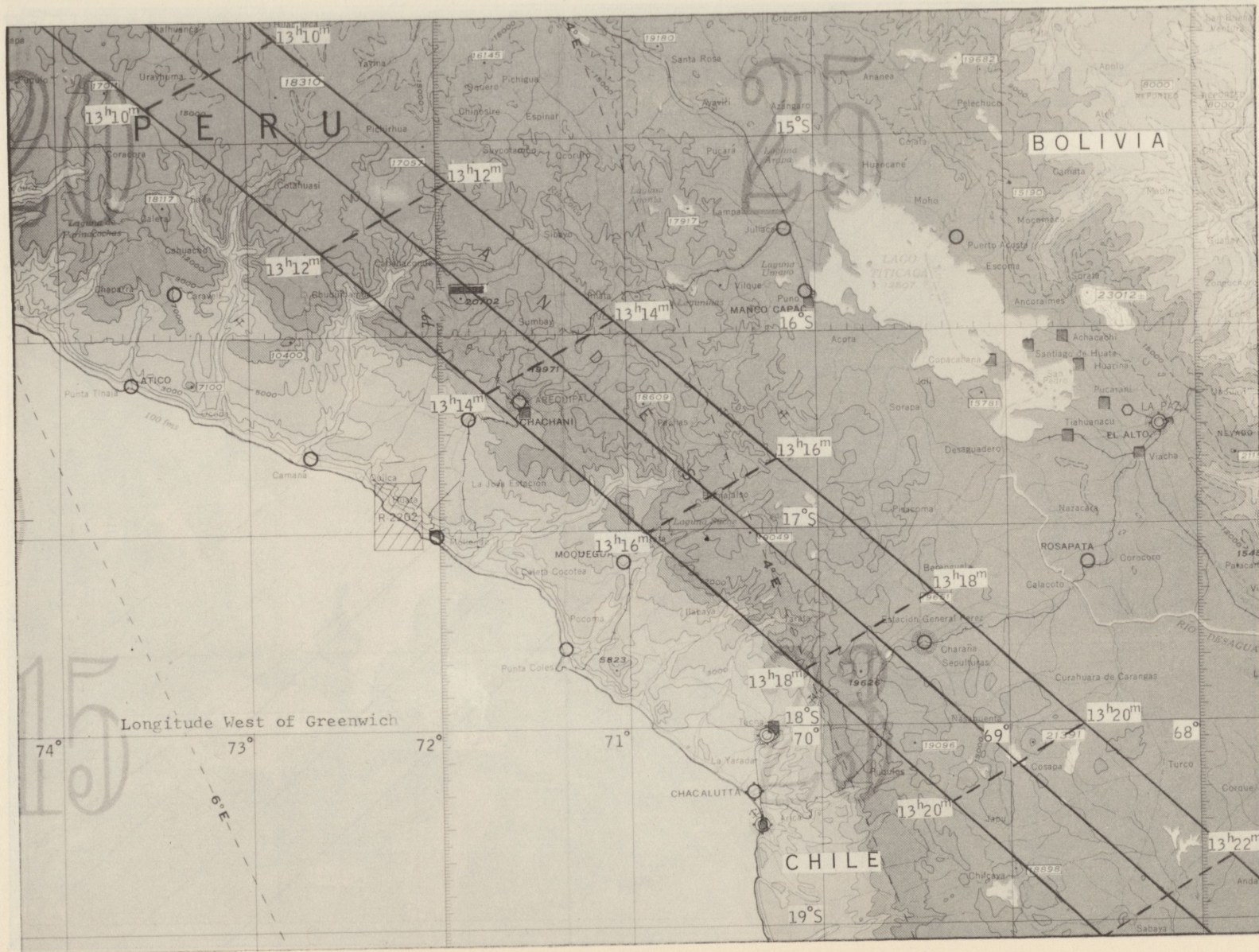
LOCAL CIRCUMSTANCES

Geographic Locations			First Contact			Second Contact		
	Latitude		Longitude		Universal Time	P	V	Universal Time
	°	'	°	'	h m s	°	°	h m s
Peru								
Huacho	-11	07.0	+ 77	35.0	11 57 04.3	303	39	13 00 45.5
Chancay	-11	35.0	+ 77	14.0	11 57 44.3	303	40	13 01 37.3
Lima	-12	06.0	+ 77	03.0	11 58 27.7	304	41	
Chosica	-11	55.0	+ 76	38.0	11 58 16.2	303	40	13 02 29.6
Lachoc	-12	53.0	+ 75	06.0	11 59 51.5	304	41	13 05 04.8
Huancavelica	-12	46.0	+ 75	02.0	11 59 42.8	303	40	13 05 16.3
Arequipa	-16	24.0	+ 71	32.0	12 06 06.1	305	45	13 13 59.8
Sumbay	-15	58.0	+ 71	22.0	12 05 28.3	304	44	13 13 02.6
Charaña, Bolivia	-17	35.0	+ 69	25.0	12 08 47.8	305	45	13 17 41.2
Bolivia								
Uyuni	-20	28.0	+ 66	48.0	12 14 53.6	306	49	13 25 50.7
Rio Mulatos	-19	40.0	+ 66	46.0	12 13 32.8	305	47	13 24 33.0
Huanchaca	-20	20.0	+ 66	40.0	12 14 43.7	306	48	13 25 30.1
Atocha	-20	55.0	+ 66	14.0	12 15 59.4	306	49	13 27 13.8
Tupiza	-21	27.0	+ 65	44.0	12 17 13.1	306	50	13 28 55.6
Argentina								
Tartagal	-22	32.0	+ 63	50.0	12 20 22.6	306	50	13 33 05.4
Hickmann	-23	13.0	+ 63	35.0	12 21 46.7	306	52	13 34 40.1
Morillo	-23	28.0	+ 62	52.0	12 22 44.2	306	52	13 36 03.5
Los Blancos	-23	36.0	+ 62	35.0	12 23 11.0	306	52	13 36 47.6
Colonia Castelli	-25	59.0	+ 60	35.0	12 29 09.7	306	56	13 44 01.5
Presidencia Roca	-26	08.0	+ 59	36.0	12 30 16.3	306	55	13 46 04.4
Corrientes	-27	30.0	+ 58	48.0	12 33 34.8	306	58	13 49 28.2
Mburucuya	-28	03.0	+ 58	15.0	12 35 08.3	306	59	13 51 23.9
Uruguiana	-29	45.0	+ 57	05.0	12 39 33.2	307	62	
Itaqui	-29	08.0	+ 56	33.0	12 38 51.8	306	60	13 55 59.9
Alegrete	-29	45.0	+ 55	46.0	12 40 51.3	306	61	13 58 25.7
Brazil								
Livramento	-30	52.0	+ 55	30.0	12 43 19.3	307	64	
Rosario do Sul	-30	15.0	+ 54	55.0	12 42 43.1	305	62	14 00 57.2
Dom Pedrito	-30	58.0	+ 54	40.0	12 44 23.3	306	64	14 02 28.6
Torquato Severo	-31	02.0	+ 54	10.0	12 45 03.5	306	64	14 03 26.7
Bage	-31	22.0	+ 54	06.0	12 45 47.2	306	64	14 04 07.4
Basilio	-31	53.0	+ 53	02.0	12 47 59.3	305	65	14 06 56.1
Pelotas	-31	45.0	+ 52	20.0	12 48 32.5	305	65	
Rio Grande	-32	03.0	+ 52	08.0	12 49 21.6	305	65	
Porto Alegre	-30	03.0	+ 51	10.0	12 46 46.8	307	59	
Bloemfontein, S. Africa	-29	05.7	- 26	14.3	15 12 46.3	262	147	
Bogotá, Colombia	+ 4	35.9	+ 74	04.9	11 46 16.0	277	358	
Bosque Alegre, Argentina	-31	35.9	+ 64	32.8	12 37 52.7	316	72	
Buenos Aires, Argentina	-34	37.3	+ 58	21.3	12 48 30.1	313	76	
Cape of Good Hope, S. Africa	-33	56.0	- 18	28.6	15 02 29.0	269	150	
Caracas, Venezuela	+10	30.4	+ 66	55.7	11 54 59.3	259	330	
Cordoba, Argentina	-31	25.3	+ 64	11.8	12 37 41.7	315	72	
Hartbeespoort, S. Africa	-25	46.4	- 27	52.6	15 17 44.9	257	144	
Johannesburg, S. Africa	-26	10.9	- 28	04.5	15 17 12.4	258	145	
La Leona, Argentina	-49	50.7	+ 73	03.0	13 19 18.1	340	120	
La Leoncita, Argentina	-31	47.8	+ 69	20.4	12 36 15.2	320	77	
La Plata, Argentina	-34	54.5	+ 57	55.9	12 49 27.3	313	76	
La Serena, Chile	-29	54.0	+ 71	18.0	12 31 33.7	320	74	
Montevideo, Uruguay	-34	54.6	+ 56	12.7	12 50 55.6	312	75	
New Orleans, Louisiana	+30	00.0	+ 90	03.3	.. .. .	...	...	
Pretoria, S. Africa	-25	47.3	- 28	13.7	15 17 47.2	257	144	
Quito, Ecuador	- 0	14.0	+ 78	29.6	11 46 22.3	288	15	
Richmond, Florida	+25	37.5	+ 80	22.8	12 08 16.4	233	294	
Rio de Janeiro, Brazil	-22	53.7	+ 43	13.4	12 49 23.8	284	30	
Santiago, Chile	-33	23.8	+ 70	32.9	12 39 28.6	323	81	
São Paulo, Brazil	-23	39.1	+ 46	37.4	12 43 24.5	289	36	
Tonantzintla, Mexico	+19	02.0	+ 98	18.8	.. .. .	...	...	

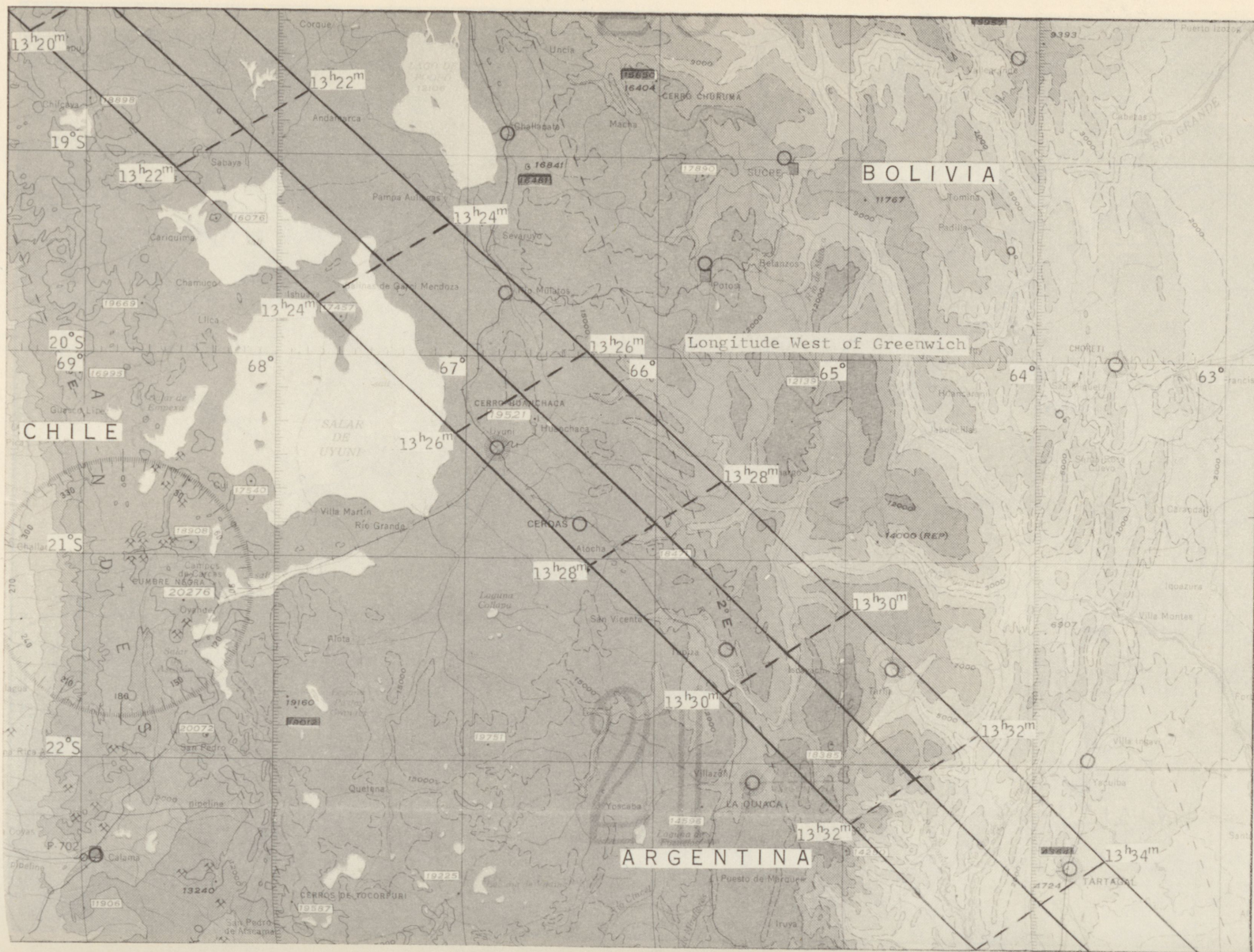
LOCAL CIRCUMSTANCES

Maximum Eclipse					Third Contact			Fourth Contact			Duration		Width of Path	
Universal Time	Magnitude	Sun's Alt.	Sun's Az.		Universal Time	P°	V°	Universal Time	P°	V°	m	s	mi	
h m s		° °			h m s			h m s						
13 01 18.2	1.018	33	104		13 01 50.8	329	61	14 13 53.0	127	212	1	05.3	44	
13 02 13.3	1.018	34	104		13 02 49.4	298	30	14 15 06.4	126	213	1	12.1	44	
13 03 07.5	0.999	35	103					14 16 13.0	126	213				
13 03 06.2	1.018	35	103		13 03 42.8	313	45	14 16 25.2	127	213	1	13.2	44	
13 05 37.3	1.019	37	103		13 06 09.8	338	71	14 20 04.4	127	214	1	05.0	45	
13 05 29.2	1.019	37	103		13 05 42.1	16	109	14 19 57.4	127	214	0	25.8	45	
13 14 20.4	1.020	43	99		13 14 41.0	245	341	14 31 38.3	127	218	0	41.2	48	
13 13 43.3	1.020	43	99		13 14 24.1	325	61	14 31 04.1	128	218	1	21.5	48	
13 18 22.8	1.021	46	97		13 19 04.4	330	67	14 37 12.4	128	221	1	23.2	50	
13 26 23.8	1.022	51	93		13 26 56.8	260	0	14 47 10.7	127	228	1	06.1	52	
13 24 56.4	1.022	51	94		13 25 19.8	8	107	14 45 41.0	128	227	0	46.8	52	
13 26 17.2	1.022	51	93		13 27 04.3	292	33	14 47 09.1	127	228	1	34.2	52	
13 27 52.7	1.022	52	92		13 28 31.6	269	10	14 49 02.9	127	230	1	17.8	52	
13 29 27.9	1.022	53	91		13 30 00.2	257	360	14 50 58.4	127	232	1	04.6	52	
13 33 50.8	1.022	56	89		13 34 36.1	336	80	14 56 32.9	128	238	1	30.7	53	
13 35 28.5	1.022	56	87		13 36 16.9	285	31	14 58 19.7	127	240	1	36.8	53	
13 36 52.4	1.023	57	86		13 37 41.3	329	75	15 00 09.2	128	243	1	37.8	53	
13 37 29.9	1.023	57	86		13 38 12.2	344	90	15 00 56.6	128	245	1	24.6	53	
13 44 50.6	1.023	61	80		13 45 39.7	280	32	15 09 17.3	127	262	1	38.2	54	
13 46 31.6	1.023	62	78		13 46 58.7	8	120	15 11 29.7	127	268	0	54.3	54	
13 50 21.6	1.023	63	74		13 51 15.0	288	44	15 15 33.7	126	278	1	46.8	54	
13 52 14.8	1.024	64	72		13 53 05.6	280	38	15 17 37.9	126	283	1	41.7	54	
13 57 18.2	0.991	65	66					15 22 52.1	125	295				
13 56 56.1	1.024	66	67		13 57 52.3	321	83	15 22 55.1	126	298	1	52.4	55	
13 59 21.0	1.024	67	64		14 00 16.3	325	90	15 25 32.2	126	304	1	50.6	55	
14 01 54.3	0.996	67	60					15 27 52.7	125	306				
14 01 39.7	1.024	67	61		14 02 22.3	350	117	15 28 04.7	126	310	1	25.1	55	
14 03 25.6	1.024	68	58		14 04 22.6	291	61	15 29 43.7	125	312	1	54.0	55	
14 04 21.8	1.024	68	57		14 05 16.9	328	99	15 30 50.8	125	315	1	50.2	55	
14 05 05.9	1.024	68	56		14 06 04.5	297	69	15 31 30.0	125	315	1	57.1	55	
14 07 49.3	1.024	69	51		14 08 42.5	333	108	15 34 26.8	125	321	1	46.4	55	
14 08 44.9	0.991	70	50					15 35 39.7	126	325				
14 09 38.5	0.994	70	48					15 36 30.9	126	325				
14 07 34.9	0.931	71	52					15 35 17.7	130	335				
16 10 09.1	0.619	6	253					.. .. .	...	...				
12 43 17.5	0.563	27	113					13 46 54.1	153	219				
13 50 24.2	0.820	57	73					15 10 28.7	115	257				
14 04 34.4	0.866	63	57					15 27 19.6	117	289				
16 05 30.6	0.702	15	258					17 02 31.1	122	358				
12 41 39.5	0.286	31	118					13 32 31.8	173	230				
13 50 31.0	0.829	57	73					15 10 56.4	116	258				
16 11 51.9	0.535	3	252					.. .. .	...	...				
16 11 41.8	0.549	3	252					.. .. .	...	...				
14 13 32.6	0.377	47	55					15 10 38.1	83	239				
13 45 02.7	0.734	52	78					15 01 02.9	110	241				
14 05 43.1	0.867	64	55					15 28 33.5	116	291				
13 39 20.2	0.737	49	82					14 54 31.6	110	234				
14 08 18.0	0.896	65	51					45 32 05.6	118	300				
12 30 43.8	0.050	1	111					12 49 00.8	192	248				
16 11 52.3	0.539	3	252					.. .. .	...	...				
12 46 28.9	0.758	26	110					13 53 58.4	140	214				
12 30 24.8	0.069	10	115					12 53 12.5	191	247				
14 09 18.0	0.612	82	53					15 35 16.6	148	35				
13 46 44.5	0.685	51	76					15 00 45.5	106	239				
14 03 40.8	0.696	77	64					15 31 03.3	144	21				
.. .. .		..	...					13 21 10.1	153	220				



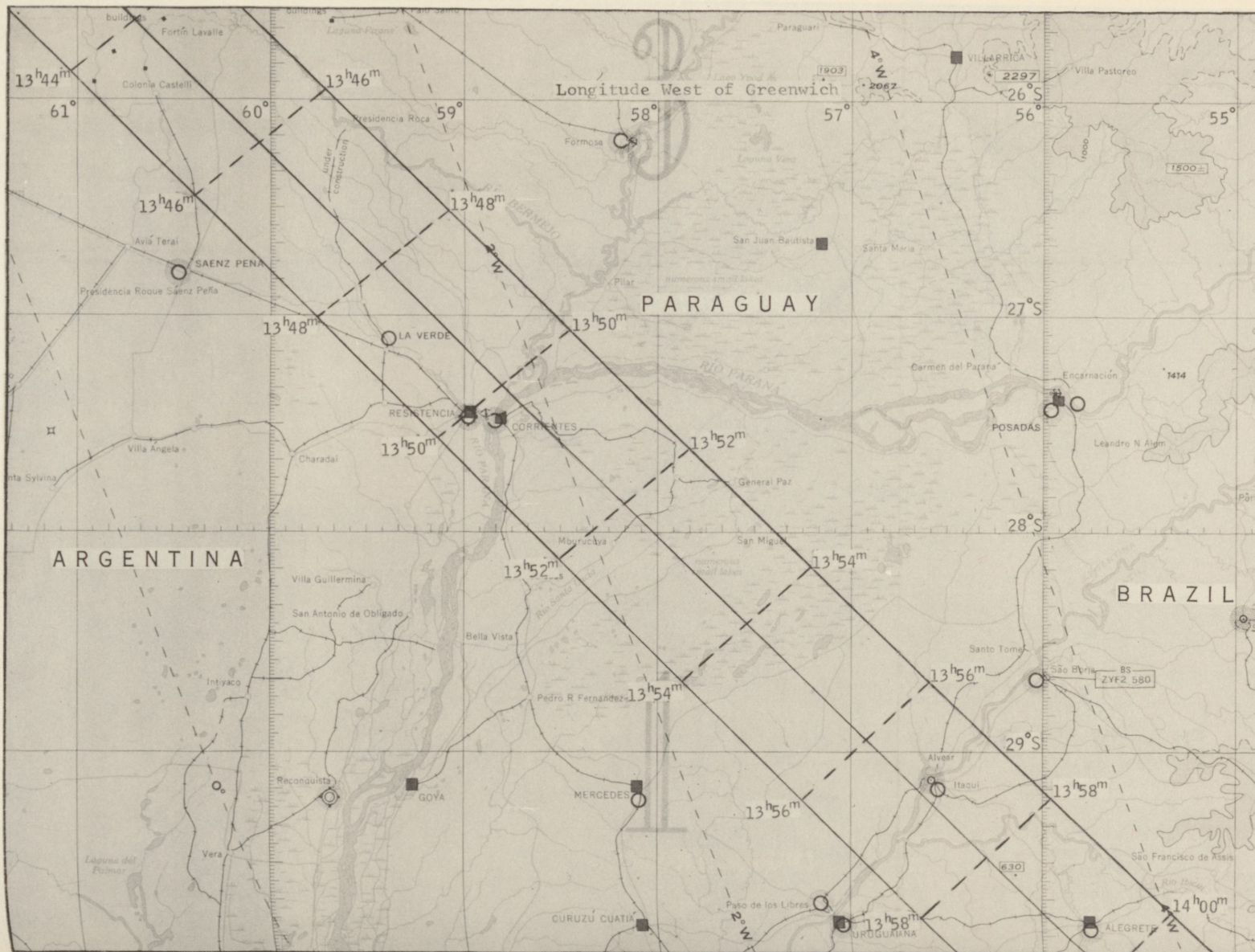


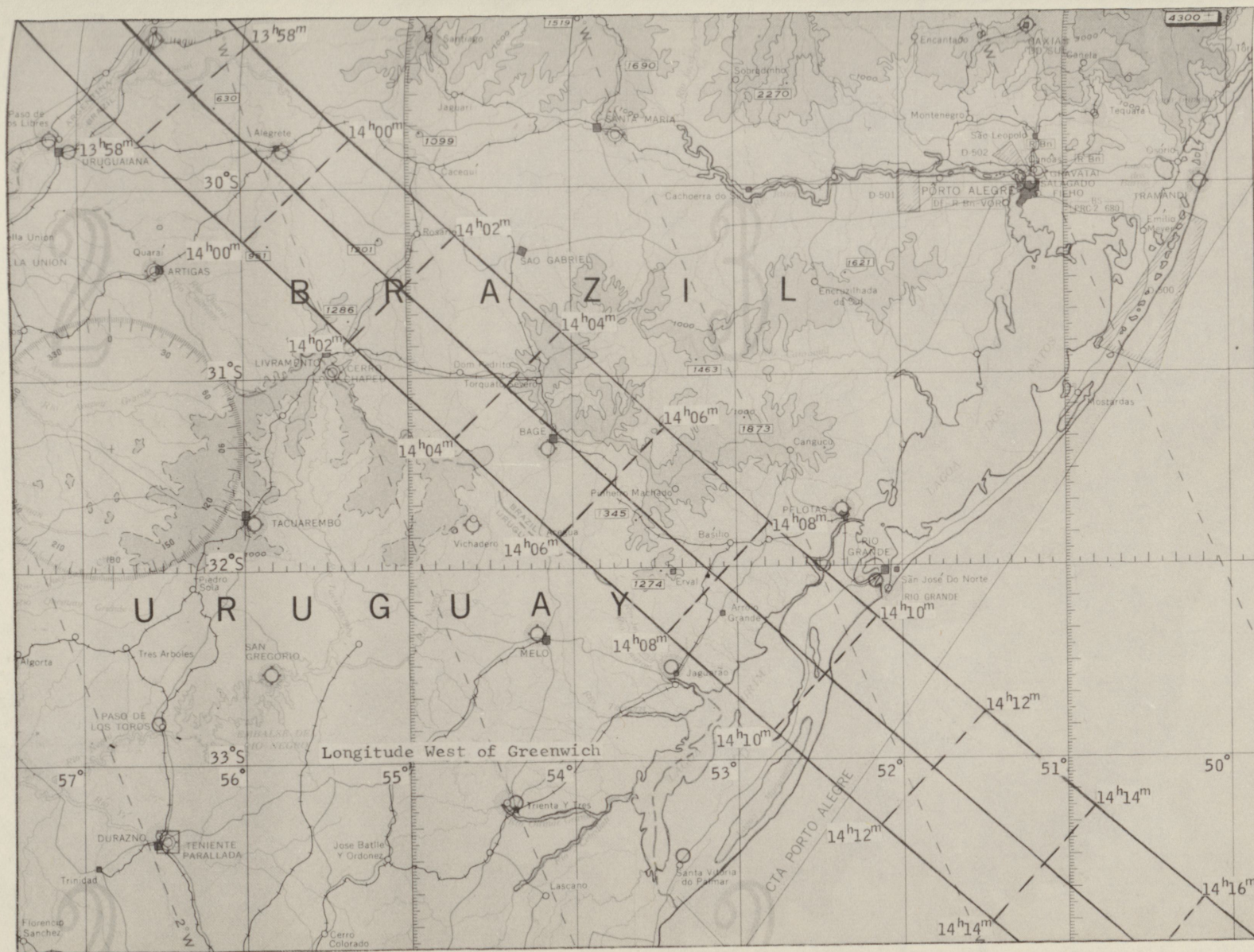
TOTAL SOLAR ECLIPSE OF 12 NOVEMBER 1966





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